

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/JP2004/006917

International filing date (day/month/year)
14.05.2004

Priority date (day/month/year)
14.05.2003

International Patent Classification (IPC) or both national classification and IPC
G03G15/043, G03G15/08

Applicant
CANON KABUSHIKI KAISHA

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2004/006917

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2004/006917

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	19-25
Inventive step (IS)	Yes: Claims	
	No: Claims	1-18,26-32
Industrial applicability (IA)	Yes: Claims	1-32
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

A. CITATIONS

The documents of the International search report (ISR) are introduced as follows:

D1= US,A,5 583 621; D2= US,A,2001/013939; D3= US,B,6 266 153.

B. EXPLANATIONS

1. Insofar clear, refer to the interpretations in point C. below, essentially the common features of the independent claims 1, 12, 19, 26 and the corresponding dependent claims relate to means for storing information suitable for setting different exposure times and adapted to the use of a photosensitive drum surface.
2. With reference to the relevant indications in the ISR it is noted that
 - D1 (brother) shows an electrophotographic printer with several levels of toner economizing modes for modulating the dot pulse width of a laser drive signal and controllable by a PC regarding both print quality and toner consumption; that
 - D2 (hewlett packard) shows an electrophotographic printer for stabilizing toner mass consumption based on an actual mass per area of toner consumed in the imaging device, whereby laser pulse width modulation in accordance with a predetermined toner density is to compensate variations in pixel development resulting from, eg, an aging laser diode; and that
 - D3 (xerox) shows an image forming device with a toner saving mode that discriminates pixels surrounded by a number of adjacent pixels having the same image data values, to alter such an output image data value towards specially a lower toner consumption.
3. Considering the task to further reduce toner consumption at still high image quality with respect to both thin lines and solid bulk areas, a skilled design engineer would be expected to scan the prior art for relevant documents and to find D1, see the introductory part. Since D1 shows a save-mode circuit (50 in D1, Fig.3) with a register (55 in D1, Fig.3) for setting exposure times corresponding to four levels ((B), (C), (D), (E) in D1, Fig.4) of an amount of usage ((c) in D1, Fig.5) of an image forming apparatus (1 in D1, Fig.1), the few limiting features of independent claim 19 specifying the storing means of claim 19, are not considered new.

In view of the above reasons, and with reference to a toner save-mode selection switch (54 in D1, Fig.3) and a laser driver (51 in D1, Fig.3) known from D1, neither one of the additional features in dependent claims 21 to 25 can support novelty, specifying additionally just an exposure device and some designation information.

4. Following the hint in D1, col.6, lines 39 ff, namely to select the toner consumption mode by way of a PC, it would appear obvious to follow up automation and to replace the known selection switch by a storing area for storing various levels of threshold information as defined in dependent claim 20.
5. Again with reference to the comments in point C. below, the additional features of the other independent claims 1, 12, 26 specify just standard use options of the known storing device relating to its application, so that the respective subject-matters of these other claims are considered obvious.
6. Considering the various known alternatives to further reduce toner consumption as known from the prior art, see the indications in the ISR, all further details defined in the dependent claims are considered to be well within any ordinary follow-up development when starting with the storing device known from D1.

C. COMMENTS ON INTERPRETATION

1. Independent claim 19 defines a storing device to be used for an apparatus having at least two different toner consumption saving modes including a "second image forming mode", with lower toner consumption based on information for setting a "second image forming condition" such as different exposure times, corresponding to an amount of usage of an image bearing member in the second image forming mode ie consistent with effects from normal use of a photosensitive drum surface in a toner consumption saving mode, in order to further reduce toner consumption at still high image quality with respect to both thin lines and solid bulk areas.
2. The other "independent" claims specify only its use, ie claims 1, 12 use of the device in, respectively, an image forming apparatus and its cartridge, claim 26 the application of the information to, exclusively, the "second image forming mode".
3. Essentially the sets of corresponding dependent claims define the same further embodiments of the storing device of claim 19, relating substantially to exposure time on the basis of some sensitivity characteristic W of the image bearing member and still shorter than a normal exposure time.
